

## **CLAIMS**

1. A method for the impregnation and treatment of microbially degradable, contaminatable and/or perishable substances/objects or parasite-  
5 attacked substances/objects, wherein said substances/objects are  
selected from wood/timber and wood products, textiles and textile raw  
materials, plastics and rubbers prone to germ contamination, natural  
and mineral insulation and sealant materials, construction materials  
made of mineral and natural substances, filters, soils and fertilizers,  
animal-derived raw materials, paints, lubricants, adhesives, detergents  
10 and cleaning agents; comprising  
  
– the distribution or application of an antimicrobial and/or antiparasitic  
composition to the surface of the above-mentioned degradable,  
contaminatable and/or perishable subjects/objects; and/or  
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– the incorporation of said antimicrobial and/or antiparasitic composition  
into said degradable, contaminatable and/or perishable  
substances/objects;  
  
20 said antimicrobial and/or antiparasitic composition containing at least  
two GRAS (generally recognized as safe) flavoring agents, but wherein  
said antiparasitic composition does not exclusively contain cinnamic  
aldehyde or a mixture of cinnamic aldehyde and terpenes.

2. The method according to claim 1, wherein said GRAS flavoring agents are selected from (a) GRAS flavor alcohols or their derivatives, (b) polyphenol compounds, (c) GRAS flavor acids or their derivatives, (d) phenols or their derivatives, (e) esters, (f) terpenes, (g) acetals, (h) aldehydes and (i) essential oils.

3. The method according to claim 1 or 2, wherein said antimicrobial and/or antiparasitic composition contains at least one GRAS flavor alcohol (a), preferably an aromatic GRAS flavor alcohol, especially benzyl alcohol.

4. The method according to claims 3, wherein said antimicrobial and/or antiparasitic composition contains less than 50% by weight, preferably less than 30% by weight, more preferably less than 20% by weight, of ethanol, isopropanol or benzyl alcohol or a mixture of these substances.

5. The method according to claim 1 or 2, wherein said antimicrobial and/or antiparasitic composition contains at least one hydrophilic alcoholic GRAS flavoring agent and/or one hydrophilic non-alcoholic GRAS flavoring agent.

6. The method according to claim 5, wherein said antimicrobial and/or antiparasitic composition further contains benzyl alcohol and/or a polyphenol compound (b).

5 7. The method according to claim 1 or 2, wherein said antimicrobial and/or antiparasitic composition contains one or more GRAS flavor alcohols or their derivatives (a) and one or more flavoring agents selected from polyphenol compounds (b) and GRAS flavor acids or their derivatives (c).

10 8. The method according to claim 7, wherein said antimicrobial and/or antiparasitic composition contains  
from 0.1 to 99% by weight, preferably from 0.5 to 99% by weight, of component (a);  
15 from 0.01 to 25% by weight, preferably from 0.01 to 10% by weight, of component (b); and  
from 0.01 to 70% by weight, preferably from 0.01 to 30% by weight, of component (c).

20 9. The method according to claim 7 or 8, wherein said GRAS flavor alcohol (a) is selected from:  
benzyl alcohol, acetoin, ethyl alcohol, propyl alcohol, isopropyl alcohol, propylene glycol, glycerol, n-butyl alcohol, iso-butyl alcohol, hexyl

alcohol, L-menthol, octyl alcohol, cinnamyl alcohol,  $\alpha$ -methylbenzyl alcohol, heptyl alcohol, n-amyl alcohol, iso-amyl alcohol, anisalcohol, citronellol, n-decyl alcohol, geraniol,  $\beta$ , $\gamma$ -hexenol, lauryl alcohol, linalool, nerolidol, nonadienol, nonyl alcohol, rhodinol, terpineol, borneol, clineol, anisole, cuminyl alcohol, 10-undecene-1-ol, 1-hexadecanol or their derivatives;

said polyphenol compound (b) is selected from:

catechol, resorcinol, hydroquinone, phloroglucinol, pyrogallol, cyclohexane, resveratrol, usnic acid, acylpolyphenols, lignins, anthocyanes, flavones, catechols, gallic acid derivatives, caffeic acid, flavonoids, derivatives of the mentioned polyphenols, and extracts from Camellia, Primula; and

said GRAS acid (c) is selected from:

acetic acid, aconitic acid, adipic acid, formic acid, malic acid, capronic acid, hydrocinnamic acid, pelargonic acid, lactic acid, phenoxyacetic acid, phenylacetic acid, valeric acid, iso-valeric acid, cinnamic acid, citric acid, mandelic acid, tartaric acid, fumaric acid, tannic acid and their derivatives.

10. The method according to one or more of claims 7 to 9, wherein said antimicrobial and/or antiparasitic composition contains

(a1) an aromatic GRAS flavor alcohol, especially benzyl alcohol, as a necessary component; and optionally  
(a2) one or more further GRAS flavor alcohols or their derivatives; and  
(b) one or more polyphenol compounds; and/or  
(c) one or more GRAS acids or their derivatives.

11. The method according to claim 10, wherein said antimicrobial and/or antiparasitic composition contains  
from 0.1 to 99% by weight, preferably from 0.1 to 75% by weight, of  
benzyl alcohol;  
from 0.01 to 99.8% by weight, preferably from 0.01 to 99% by weight, of  
component (a2); and  
from 0.01 to 25% by weight, preferably from 0.01 to 10% by weight, of  
component (b);  
from 0.01 to 70% by weight, preferably from 0.01 to 30% by weight, of  
component (c).

12. The method according to claim 10 or 11, wherein said antimicrobial and/or antiparasitic composition contains one or more polyphenol compounds (b) as a necessary component and optionally one or more GRAS acids (c) or their derivatives.

13. The method according to one or more of claims 7 to 12, wherein said antimicrobial and/or antiparasitic composition contains further GRAS flavoring agents selected from (d) phenols, (e) esters, (f) terpenes, (g) acetals, (h) aldehydes and (i) essential oils.

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14. The method according to claim 13, wherein said antimicrobial and/or antiparasitic composition contains from 0.001 to 25% by weight, preferably from 0.01 to 9% by weight, of said further GRAS flavoring agents (d) to (i).

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15. The method according to claim 13 or 14, wherein said further GRAS flavoring agents are phenols (d) and/or essential oils (i).

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16. The method according to one or more of claims 2 to 15, wherein said antimicrobial and/or antiparasitic composition does not contain any derivatives of said GRAS flavoring agents.

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17. The method according to one or more of claims 10 to 16, wherein said antimicrobial and/or antiparasitic composition contains one or two GRAS flavor alcohols (a2) and at least one polyphenol compound (b).

18. The method according to claim 17, wherein said polyphenol compound (b) is tannin.

19. The method according to claim 18, wherein said antimicrobial and/or antiparasitic composition contains from 0.1 to 98% by weight of benzyl alcohol and from 0.01 to 10% by weight of tannin.

5 20. The method according to claim 1, wherein said antimicrobial and/or antiparasitic composition contains

(i) at least one lipophilic GRAS (generally recognized as safe) flavoring agent; and

10 (ii) at least one hydrophilic GRAS flavoring agent.

21. The method according to claim 20, wherein said lipophilic GRAS flavoring agents are selected from (a<sub>1</sub>) lipophilic GRAS flavor alcohols or their derivatives, (b) polyphenol compounds, (c<sub>1</sub>) lipophilic GRAS flavor acids or their derivatives, (d) phenols or their derivatives, (e<sub>1</sub>) lipophilic esters, (f) terpenes, (g) acetals, (h<sub>1</sub>) lipophilic aldehydes and (i) essential oils.

20 22. The method according to claim 20 or 21, wherein said antimicrobial and/or antiparasitic composition contains at least two lipophilic GRAS flavoring agents, preferably two lipophilic GRAS flavor alcohols (a<sub>1</sub>).

23. The method according to claim 21 or 22, wherein said lipophilic GRAS flavor alcohols are selected from aromatic GRAS flavor alcohols, including benzyl alcohol, 2-phenylethanol, 1-phenylethanol, cinnamyl alcohol, hydrocinnamyl alcohol, 1-phenyl-1-propanol and anisalcohol, and aliphatic GRAS flavor alcohols, including n-butyl alcohol, iso-butyl alcohol, hexyl alcohol, L-menthol, octyl alcohol, heptyl alcohol, n-amyl alcohol, iso-amyl alcohol, anisalcohol, citronellol, n-decyl alcohol, geraniol,  $\beta$ , $\gamma$ -hexenol, lauryl alcohol, linalool, nerolidol, nonadienol, nonyl alcohol, rhodinol, terpineol, borneol, clineol, anisole, cuminyl alcohol, 10-undecene-1-ol and 1-hexadecanol and their derivatives, wherein the aromatic GRAS flavor alcohols, especially benzyl alcohol, are preferred.

24. The method according to one or more of claims 20 to 23, wherein said hydrophilic GRAS flavoring agent is a hydrophilic alcoholic GRAS flavoring agent ( $a_n$ ) or a hydrophilic non-alcoholic GRAS flavoring agent, wherein said hydrophilic alcoholic GRAS flavoring agent ( $a_n$ ) is preferably a monohydric or polyhydric alcohol having from 2 to 10, preferably from 2 to 7, carbon atoms, which is more preferably selected from acetoin, ethyl alcohol, propyl alcohol, iso-propyl alcohol, propylene glycol and glycerol; and said hydrophilic non-alcoholic GRAS flavoring agent is a hydrophilic organic GRAS flavor acid ( $c_n$ ) having from 1 to 15 carbon atoms or a



physiological salt thereof, a hydrophilic acetate ( $e_h$ ) or a hydrophilic aldehyde ( $h_h$ ).

5           25.    The method according to claim 24, wherein said hydrophilic organic acid ( $c_h$ ) contains from 2 to 10 carbon atoms and is especially selected from acetic acid, aconitic acid, formic acid, malic acid, lactic acid, phenylacetic acid, citric acid, mandelic acid, tartaric acid, fumaric acid, tannic acid, hydrocinnamic acid and their physiological salts; said hydrophilic acetate ( $e_h$ ) is selected from allicin, triacetin, potassium acetate, sodium acetate and calcium acetate; and/or  
10           said hydrophilic aldehyde ( $h_h$ ) is selected from furfural, propionaldehyde and vanillin.

15           26.    The method according to claim 24, wherein said antimicrobial and/or anti-parasitic composition contains less than 50% by weight, preferably less than 30% by weight, more preferably less than 20% by weight, of benzyl alcohol or of a mixture of benzyl alcohol with ethanol and/or isopropanol.

20           27.    The method according to claim 24 or 25, wherein said antimicrobial and/or antiparasitic composition contains two lipophilic GRAS flavor alcohols ( $a_i$ ), but no benzyl alcohol and no polyphenol compounds ( $b$ ).

28. The method according to claim 24 or 25, wherein said antimicrobial and/or antiparasitic composition contains benzyl alcohol and/or a polyphenol compound (b), but no further GRAS flavor alcohols.
- 5 29. The method according to claim 27 or 28, wherein said antimicrobial and/or antiparasitic composition contains exclusively non-alcoholic hydrophilic GRAS flavoring agents, especially exclusively a hydrophilic GRAS flavor acid (c<sub>h</sub>).
- 10 30. The method according to claim 28 or 29, wherein said antimicrobial and/or antiparasitic composition contains from 0.01 to 99% by weight, preferably from 0.1 to 90% by weight, of benzyl alcohol or polyphenol compounds (b); and from 0.01 to 50% by weight, preferably from 0.1 to 30% by weight, of hydrophilic non-alcoholic GRAS flavoring agents.
- 15 31. The method according to claim 20 or 21, wherein said antimicrobial and/or antiparasitic composition contains (A) one or more GRAS flavor alcohols (a) or their derivatives; and (B) one or more flavoring agents selected from polyphenol compounds (b) and lipophilic GRAS flavor acids or their derivatives (c).
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32. The method according to claim 31, wherein said antimicrobial and/or anti-parasitic composition contains  
from 0.1 to 99% by weight, preferably from 0.5 to 99% by weight, of component (a);  
5 from 0.01 to 25% by weight, preferably from 0.01 to 10% by weight, of component (b); and  
from 0.01 to 70% by weight, preferably from 0.01 to 30% by weight, of component (c).
- 10 33. The method according to claim 31 or 32, wherein said antimicrobial and/or antiparasitic composition contains further GRAS flavoring agents selected from (d) phenols or their derivatives, (e) lipophilic esters, (f) terpenes, (g) acetals, (h) lipophilic aldehydes and (i) essential oils.
- 15 34. The method according to one or more of claims 31 to 33, wherein said polyphenol compound (b) is selected from:  
catechol, resorcinol, hydroquinone, phloroglucinol, pyrogallol,  
cyclohexane, resveratrol, usnic acid, acylpolyphenols, lignins,  
anthocyanins, flavones, catechols, gallic acid derivatives, caffeic acid,  
20 flavonoids, derivatives of the mentioned polyphenols, and extracts from Camellia, Primula; and  
said lipophilic GRAS acid (c) is selected from:

adipic acid, capronic acid, pelargonic acid, phenoxyacetic acid, valeric acid, iso-valeric acid, cinnamic acid, mandelic acid and their derivatives.

- 5           35.    The method according to one or more of claims 31 to 34, wherein  
component (A) of said antimicrobial/antiparasitic composition contains  
benzyl alcohol as a necessary component (a<sub>1</sub>) and optionally one or  
more further lipophilic GRAS flavor alcohols or their derivatives (a<sub>i</sub>).
- 10           36.    The method according to claim 34 or 35, wherein said antimicrobial  
and/or antiparasitic composition contains  
from 0.1 to 99% by weight, preferably from 0.1 to 75% by weight, of  
benzyl alcohol;  
from 0.01 to 99.8% by weight, preferably from 0.01 to 99% by weight, of  
component (a<sub>i</sub>); and  
15           from 0.01 to 25% by weight, preferably from 0.01 to 10% by weight, of  
component (b);  
from 0.01 to 70% by weight, preferably from 0.01 to 30% by weight, of  
component (c).
- 20           37.    The method according to claim 35 or 36, wherein component (B) of said  
antimicrobial and/or antiparasitic composition contains one or more  
polyphenol compounds (b) as a necessary component and optionally (c)  
one or more GRAS acids or their derivatives.

38. The method according to claim 36 or 37, wherein said antimicrobial and/or antiparasitic composition contains further GRAS flavoring agents (d) to (i), preferably from 0.001 to 25% by weight, more preferably from 0.01 to 9% by weight, of said further GRAS flavoring agents (d) to (i).

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39. The method according to claim 38, wherein said further GRAS flavoring agents are phenols (d) and/or essential oils (i).

10 40. The method according to one or more of claims 21 to 39, wherein said antimicrobial and/or antiparasitic composition does not contain any derivatives of said GRAS flavoring agents.

15 41. The method according to one or more of claims 34 to 40, wherein said antimicrobial and/or antiparasitic composition contains one or two lipophilic GRAS flavor alcohols (a<sub>1</sub>) and at least one polyphenol compound (b).

42. The method according to claim 41, wherein said polyphenol compound (b) is tannin.

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43. The method according to claim 42, wherein said antimicrobial and/or antiparasitic composition contains from 20 to 98% by weight of benzyl alcohol and from 0.01 to 10% by weight of tannin.

44. The method according to one or more of claims 1 to 43, wherein said antimicrobial and/or antiparasitic composition further contains monohydric or polyhydric alcohols having from 2 to 10 carbon atoms, emulsifiers, stabilizers, antioxidants, preservatives, solvents and/or carriers.

45. The method according to one or more of claims 1 to 43, wherein said antimicrobial and/or antiparasitic composition exclusively consists of GRAS flavoring agents.

46. The method according to one or more of claims 1 to 21, wherein said microbially degradable and/or perishable substances/objects are selected from air filters, wool and cotton.

47. Use of an antimicrobial/antiparasitic composition as defined in claims 1 to 45, preferably as defined in claims 20 to 45, for the impregnation or surface treatment of microbially degradable, contaminatable and/or perishable substances/objects or of parasite-attacked substances/objects or of substances/objects which have to be self-decontaminating, wherein said substances/objects are as defined in claim 1.

48. Use of an antimicrobial/antiparasitic composition as defined in claims 1 to 45, preferably as defined in claims 20 to 45, for incorporation into microbiologically degradable, contaminatable and/or perishable substances/objects, or into parasite-attacked substances/objects or into substances/objects which have to be self-decontaminating, wherein said substances/objects are as defined in claim 1.

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